

Claims

1. A cooling device, especially for electronic power components (5; 45), with a heat conducting cooling plate for the thing or things to be cooled and a platelike distributing device (4; 54; 4') arranged in the vicinity of the cooling plate (6; 43) for a cooling fluid, which distributing device on its side facing the cooling plate (6; 43) has a plurality of outlet openings (9) for the cooling fluid, which outlet openings are arranged in spaced condition from the cooling plate (6; 43) and are directed toward the cooling plate, and having at least one drain opening (10) for the cooling fluid, characterized in that the distributing device (4; 54; 4') has a first plate (1; 71) in which the outlet openings (9) and a plurality of drain openings (10) are uniformly distributed, a second plate (2; 72) and a third plate (3; 53; 73), which plates are superimposed relative to one another and of which two plates (1, 2; 2, 3; 1, 53; 2, 53; 71, 72; 72, 73) are such that one of said two plates bounds a feed channel (13) connected with all of the outlet openings and one of said two plates bounds a drain channel (12) connected with all of the drain openings (10).
2. A cooling device according to claim 1, further characterized in that the feed channel (13) is connected with the outlet openings (9) through tubular conductors (17) which pass through the drain channel (12), and the drain openings (10) discharge directly into the drain channel (12).
3. A cooling device according to claim 2, further characterized in that the second plate (2) is arranged between the first plate (1) and the third plate (3), and the tubular conductors (17) are formed as one piece with the second plate (2).
4. A cooling device according to claim 3, further characterized in that the tubular conductors (17) are connected with the outlet openings by plug connections.

5. A cooling device according to claim 1, further characterized in that the outlet openings (9) are connected directly to the feed channel (12) and the drain openings (12) are connected with the drain channel (12) by tubular conductors (55; 96) passing through the feed channel (13).
6. A cooling device according to claim 5, further characterized in that the second plate (2) is arranged between the first plate (1) and the third plate (3; 53), and the tubular conductors (55) are formed as one piece with the first plate (1).
7. A cooling device according to claim 6, further characterized in that the tubular conductors (55) are connected with holes (56) passing through the second plate (2) by a plug connection.
8. A cooling device according to one of claims 2 to 7, further characterized in that the first plate (1) is received in an opening (20) in a cover plate (21) of a housing (22) which opening is covered by the cooling plate (6), the second plate (2) is received in an opening (23) in an intermediate plate (24) of the housing (22), and the third plate (3) is formed by a bottom plate of the housing (22).
9. A cooling device according to claim 6 or 7, further characterized in that the third plate (53) is provided with outlet openings (59) directed to a second cooling plate (61), which outlet openings (59) are connected with the feed channel (13) by tubular conductors (58) passing through the second plate (2), and that the third plate (53) has drain openings (63) leading to the drain channel (12).
10. A cooling device according to one of claims 2 to 9, further characterized in that each cooling plate (6) is made of metal and at least the second plate (2; 72) and the third plate (3; 53; 73) as well as the tubular conductors (17; 55; 58) are made from heat insulating thermoplastic plastic material.

11. A cooling device according to claim 1, further characterized in that between the first plate (71) and the second plate (72) is arranged a fourth plate (74) which lies on the first and second plates (71, 72), in which fourth plate (72) is a somewhat comb shaped first aperture (76) which laterally bounds the feed channel (13), that between the second plate (72) and the third plate (73) is arranged a fifth plate (75) lying on the second plate (72) and the third plate (71) in which fifth plate (75) is a somewhat comb-shaped second aperture (77) which laterally bounds the drain channel (12), that each comb toothlike corresponding branch (78) of the first aperture (76) has associated with it a group (79) of outlet openings (9) of the first plate (71), that each tongue (80) of the fourth plate (74) located between neighboring branches (78) of the first aperture (76) has a group (81) of drain openings (72), each of which drain openings (72) registers with a drain opening (10) in the first plate (71) and a drain opening (83) in the second plate (72), and that each group of drain openings (73) of the second plate (72) is associated with one of the comb-tooth corresponding branches (84) of the second aperture (77).

12. A cooling device according to claim 11, further characterized in that between the cooling plate (6) and the first plate (71) is arranged a sixth plate (86) which lies on the cooling plate (6) and the first plate (71), which sixth plate (86) has holes (87) formed in it, and in that through each of said holes (87) at least one of the groups (79) of outlet openings (9) and drain openings (10) in the first plate stand in connection with the cooling plate (6).

13. A cooling device according to claim 11 or 12, further characterized in that the first aperture (76) is connected with an inlet connector through registering holes (88-90) in the second, third and fifth plates (72, 73, 75) and the second aperture (77) is connected with an outlet connector through a hole (91) in the third plate (73).

14. A cooling device according to one of claims 11 to 13, further characterized in that the plates are sealingly connected with one another.

15. A cooling device according to one of claims 11 to 14, further characterized in that at least the first to fifth plates (71-75) are made of plastic or metal and the cooling plate (6) is made of metal.